

Remarks

No amendments are being made, for the reasons set out below.

Claim 1 and other claims are rejected under 35 U.S.C. §103 for obviousness over a combination of Jardetsky and Anderson. The Examiner acknowledges that Jardetsky does not show the claim feature of removing fewer selected adjacencies from the overlay topology if no path is available, and repeating the path computation. Anderson is cited as showing these features, and it is alleged to have been obvious to incorporate these into Jardetsky.

As will now be explained, Anderson and Jardetsky represent different approaches which are incompatible alternatives, so it would not have been obvious to combine them. Even if they were combined, Anderson does not show all the missing features, and so the combination would not lead to the invention as claimed.

To summarize Anderson, it indicates that when a packet is unable to reach a destination, an alternate route is computed that does not share the next hop in a logical topology, with the original route, and this is repeated for calculating a next hop and so on, where there is a failure, until the destination is reached. In other words only the hops along the original logical path to that destination are removed when computing a backup path to use in the case of a failure. This is completely different from the method claimed and the method of Jardetsky. There is no mention in Anderson of removing adjacent hops which are adjacent to the original hops.

Of course the removal of adjacencies is much more significant than merely removing the hops of the original path. For example it enables removal of hops which share the same underlying physical entities which may have failed. This enables a wider range of failures to be overcome.

The claim also specifies retrying the path computation with fewer of the adjacencies removed, if necessary. This helps enables a less optimal path to be found, when there is no optimal path, which may provide many grades of weaker protection and so clearly makes better use of the available resources. There is no suggestion of this graded search for a successively weaker path, in Anderson.

Hence neither Jardetsky nor Anderson show the claim feature of removing fewer adjacencies and retrying the path computation to obtain the weaker protection when there is no path available which avoids all the adjacencies. Hence this claim cannot be obvious over the cited references taken alone or in combination.

The cited passages of Anderson say

[0048] The network nodes preferably use a fast detection mechanism for detecting network failures quickly (relative to a traditional failure detection mechanism). Upon detecting a network failure, the network nodes switch certain communications to one or more recovery paths in order to bypass the network failure, while communications unaffected by the network failure typically remain on the primary paths. The switch over to the recovery paths can be accomplished, for example, by removing the primary path from the forwarding table, blocking the primary path in the forwarding table, or marking the recovery path as a higher priority path than the primary path in the forwarding table (i.e., assuming the recovery paths are already installed in the forwarding table). The network nodes may switch all communications from a failed primary path to a recovery path, or may switch only a portion of communications from the failed primary path to the recovery path, perhaps using IP Differentiated Services (DiffServ) or other prioritization scheme to prioritize traffic. By detecting the network failure quickly and switching communications to pre-computed recovery paths, network failures are bypassed quickly.

[0078] In any layered network model, failures can be understood as relating to a certain layer. Each layer has some capability to cope with failures. If a particular layer is unable to overcome a failure, that layer typically reports the failure to a higher layer that may have additional capabilities for coping with the failure. For example, if a physical link between two nodes is broken, it is possible to have another link on standby and switch the traffic over to this other link. If the link control logic (L2) fails, it is possible to have an alternate in place. If all of these methods are unable to resolve the problem, the failure is passed on to the network layer (L3).

This confirms the arguments set out above that Anderson is not relevant.

Regarding independent claim 3, this claim recites a method of calculating a protection path by defining in a model of the network "a hierarchy of protection levels, each said protection level being characterised by a respective set of broken adjacencies in said model; attempting to calculate a recovery path for a selected protection level in said hierarchy; and if no said path is available, repeating said calculation attempt for successive further protection levels in said hierarchy until a protection path is identified."

The Examiner tries to argue that Anderson shows in the above paras 0048 and 0078 the claim features of if no path is available, repeating the calculation for further protection levels. There is mention of reporting failures to higher layers, but not of repeating a path calculation for further protection levels. This can bring similar advantages to those explained above in relation to claim 1. There is no suggestion of this nor how to achieve the advantages in Anderson. Hence this claim cannot be obvious over the cited references taken alone or in combination.

Regarding independent claim 4, this has features corresponding to those of claim 3 and so is not obvious for the same reasons.

Regarding independent claims 15, 16, 17, 18, 19 and 21, the same reasons as for claim 1 apply.

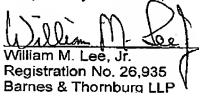
All the dependent claims are allowable as they depend on allowable main claims.

Regarding item 4, the word "fewer" normally means less than before. In the context it is clear that it has its usual meaning. It can of course encompass one less or two less than before, or any number less than before. There should be no need to explain this further. If the Examiner maintains this rejection, further explanation of what exactly is unclear about this relatively simple word would be appreciated.

Accordingly all the points raised have been dealt with, all the claims are submitted to be allowable and reconsideration is requested.

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